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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,054	11/25/2003	Carol Jeffcoate	HO2-0002	7777

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EXAMINER	
CHUO, TONY SHENG HSIANG	
ART UNIT	PAPER NUMBER
1745	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/723,054	JEFFCOATE, CAROL	
	Examiner	Art Unit	
	Tony Chuo	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2/12/07*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/12/07 has been entered.

Response to Amendment

2. Claims 12-25 are currently pending. Claims 1-11 are cancelled. The previously stated 112 rejections for claims 12-25 are withdrawn. Claims 12-25 do overcome the previously stated 103 rejections. However, upon further consideration, claims 12-25 are rejected under the following new 103 rejections.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 12, 13, 16-20, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai (JP 2002-141077) in view of Kaneko (JP 06-318736). The

Shirai reference discloses a fuel cell stack "10" comprising: solid polymer electrolyte fuel cells "1" that are proton exchange membrane fuel cells; thermoelectric elements "7" in between adjacent fuel cells "1" in the fuel cell stack wherein each thermoelectric element "7" is adjacent and in contact with the fuel cell "1"; and field plate "8" for cooling agents that functions as a heat sink in thermal contact with a periphery of the fuel cell stack (See paragraphs [0015],[0027] and Drawing 3). It also discloses a thermoelectric element "7" that comprises a p-type semiconductor "7A" and a n-type semiconductor "7B" which essentially forms a Peltier device (See paragraph [0018] and Drawing 2). It also discloses measuring the temperature of the oxygen pole side field plate and also the temperature of the thermoelectric element (See [0009]). Examiner's note: It is inherent from the teachings of Shirai that each thermoelectric element comprises one or more temperature sensing devices that are connected via control circuitry.

However, Shirai does not expressly teach adjusting a voltage of a power source in response to the measured temperature to heat or cool the fuel cell assembly in contact with the thermoelectric layer wherein the thermoelectric layer comprises one or more thermoelectric devices in electrical communication with the power source. The Kaneko reference discloses a method of controlling the temperature of a temperature-controlled object by using a Peltier thermoelectric element comprising: a step of passing a current by electrical potential difference in the direction of a part connected to the p-type thermoelectric material from the part connected to the n-type thermoelectric material in order to cool the temperature controlled object; and a step of reversing the direction of the current in order to heat the temperature controlled object (See

paragraphs [0016],[0022]). Examiner's note: It is inherent in the Kaneko reference that a power source is electrically connected to the thermoelectric element in order to control the electric potential difference of the thermoelectric element. It is also inherent that the heat distribution of the fuel cell assembly will be substantially uniform as a result of heating or cooling the fuel cell stack by using the Peltier device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to operate the Shirai fuel cell stack by include a step of adjusting a voltage of a power source in response to the measured temperature to heat or cool the fuel cell assembly in contact with the thermoelectric layer wherein the thermoelectric layer comprises one or more thermoelectric devices in electrical communication with the power source in order to more efficiently utilize the Peltier device to maintain an uniform temperature distribution of the fuel cell stack.

Examiner's note: The Kaneko reference is relevant to the Shirai reference and the applicant's field of endeavor because it solves the same problem of regulating the temperature of a temperature controlled object by using a Peltier device. In addition, the motivation to combine the Kaneko reference with the Shirai reference is found in the knowledge generally available to one of ordinary skill in the art.

5. Claims 14 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai (JP 2002-141077) in view of Kaneko (JP 06-318736) as applied to claim 12 and 18 above, and further in view of Doke (US 5576512). However, Shirai as modified by Kaneko does not expressly teach a power source that is a battery. The Doke reference discloses thermoelectric systems where the power source is a battery (See

column 2, lines 30-35). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Shirai/Kaneko method of controlling the temperature of the fuel cell stack to include a power source that is a battery in order to be able to heat the fuel cells during start-up without using electrical energy generated by the fuel cells.

6. Claims 15 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai (JP 2002-141077) in view of Kaneko (JP 06-318736) as applied to claim 12 and 18 above, and further in view of Cargnelli et al (US 5753383). However, Shirai as modified by Kaneko does not expressly teach a power source that is the fuel cell assembly. The Cargnelli reference discloses a thermoelectric element that is electrically connected to the fuel cell stack so that the fuel cells' current can be applied to the Peltier module to create a temperature gradient or difference across the element (See column 4, lines 47-51). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Shirai/Kaneko method of controlling the temperature of the fuel cell stack to include a power source that is the fuel cell assembly in order to more efficiently utilize the power generated by the fuel cell stack to maintain the fuel cell at a uniform temperature.

7. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai (JP 2002-141077) in view of Kaneko (JP 06-318736) as applied to claim 12 and 18 above, and further in view of Walsh (US 2003/0044662). However, Shirai as modified by Kaneko does not expressly teach temperature sensing devices that are thermocouples. The Walsh reference discloses a thermocouple coupled to a control

circuit for regulating the temperature of the fuel cell (See paragraph [0026]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Shirai/Kaneko method of controlling the temperature of the fuel cell stack to include thermocouples associated with each thermoelectric device so that temperature of the fuel cell can be more reliably measured.

Response to Arguments

8. Applicant's arguments with respect to claims 12-25 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy Tsang-Foster can be reached on (571) 272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

SUSY TSANG-FOSTER
PRIMARY EXAMINER